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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,584	08/19/2003	Yoshimasa Takahashi	056208.52669US	2929
23911	7590	01/10/2005	EXAMINER	
CROWELL & MORING LLP INTELLECTUAL PROPERTY GROUP P.O. BOX 14300 WASHINGTON, DC 20044-4300			NGUYEN, HANH N	
			ART UNIT	PAPER NUMBER
			2834	

DATE MAILED: 01/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/642,584	<b>Applicant(s)</b> TAKAHASHI ET AL.	
	<b>Examiner</b> Nguyen N Hanh	<b>Art Unit</b> 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunaga et al. in view of Franz et al.

Regarding claim 1, Sunaga et al. disclose a multi-phase alternating-current rotational electric machine comprising: a housing (21 and 22 in Fig. 1), a rotor shaft (10) rotatably installed in the housing, a magnetized rotor (3) fixed to the rotor shaft, a stator (2) which is arranged such that the windings of the stator are wound around the stator core fixed to the housing (by means of stator housing 4), multiple semiconductor switching devices (41), installed in the housing, which adjust currents of the stator (Col. 4, lines 5-10), and a heat sink (70) fixed to the semiconductor switching devices so that heat can be conducted, wherein the semiconductor switching device is electrically insulated from the heat sink (Col. 6, lines 30-35), and the heat sink is grounded to the housing (21 in Fig.1). Sunaga et al. fail to show the semiconductor switching device is separated in each phase.

However, Franz et al. disclose an electric machine structure wherein the semiconductor switching device is separated in each phase (Fig. 2 and Col. 4, lines 1-

25) for the purpose of improving cooling efficiency of the electronic devices (Col. 1, lines 65-67).

Since Sunaga et al. and Franz et al. are in the same field of endeavor, the purpose disclosed by Franz et al. would have been recognized in the pertinent art of Sunaga et al.

It would have been obvious at the time the invention was made to a person having an ordinary skill in the art to modify Sunaga et al. by making three independent heat sinks wherein the electronic switching device in each heat sink corresponds to each phase as taught by Franz et al. for the purpose of improving cooling efficiency of the electronic devices.

Regarding claim 2, Sunaga et al. show all limitations of the claimed invention (refer to the rejection of claim 1) except showing a multi-phase alternating-current rotational electric machine wherein the temperature of the multiple semiconductor switching devices is substantially determined in each phase.

However, Franz et al. disclose an electric machine structure wherein the temperature of the multiple semiconductor switching devices is substantially determined in each phase (inherent because the switching device in each phase is placed in independent heat sink) for the purpose of improving cooling efficiency of the electronic devices.

Since Sunaga et al. and Franz et al. are in the same field of endeavor, the purpose disclosed by Franz et al. would have been recognized in the pertinent art of Sunaga et al.

It would have been obvious at the time the invention was made to a person having an ordinary skill in the art to modify Sunaga et al. by making three independent heat sinks so that temperature of the multiple semiconductor switching devices is substantially determined in each phase as taught by Franz et al. for the purpose of improving cooling efficiency of the electronic devices.

2. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunaga et al. in view of Franz et al. and further in view of Kershaw et al.

Regarding claim 3, Sunaga et al. and Franz et al. show all limitations of the claimed invention except showing a multi-phase alternating-current rotational electric machine wherein multiple fins are arranged on the base surface of said heat sink and the substantially full flow of the air entering into said housing passes through the multiple fins.

However, Kershaw et al. disclose an electric machine structure wherein multiple fins are arranged on the base surface of said heat sink and the substantially full flow of the air entering into the motor housing passes through the multiple fins (Fig. 7-10 and Col. 4, lines 28-50) for the purpose of making cooling air flow through the motor (Col. 1, lines 55-60).

Since Sunaga et al., Franz et al. Kershaw et al are in the same field of endeavor, the purpose disclosed by Kershaw et al. would have been recognized in the pertinent art of Sunaga et al. and Franz et al.

It would have been obvious at the time the invention was made to a person having an ordinary skill in the art to modify Sunaga et al. and Franz et al. by forming

the heat sink inside the housing and the multiple fins are arranged on the base surface of said heat sink and the substantially full flow of the air entering into the motor housing passes through the multiple fins as taught by Kershaw et al. for the purpose of making cooling air flow through the motor.

Regarding claim 4, Kershaw et al. also disclose an electric machine structure wherein multiple fins are arranged on the base surface of said heat sink and a cover, which has an opening almost identical to the projection of the heat sink in the direction of said rotor shaft, is provided (Figs. 7-10).

Regarding claim 5, Kershaw et al. also disclose an electric machine structure wherein the base surface of said heat sink (162 in Fig. 8b) is placed in parallel with the direction of the diameter of said rotor shaft (parallel to the circular cross surface of rotor shaft).

Regarding claim 6, Kershaw et al. also disclose an electric machine structure wherein said multiple fins of said heat sink are concentrically arranged with said rotor shaft as the center.

3. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunaga et al. in view of Franz et al. and further in view of Suzuki et al. (JP410209357)

Regarding claim 7, Sunaga et al. and Franz et al. show all limitations of the claimed invention except showing a multi-phase alternating-current rotational electric machine wherein said multiple fins located on the base surface of said heat sink are columnar and the multiple columnar fins are arranged on the base surface in a lattice-like configuration.

However, Suzuki et al. disclose a method for making heat sink wherein said multiple fins located on the base surface of said heat sink are columnar and the multiple columnar fins are arranged on the base surface in a lattice-like configuration (Fig. 1) for the purpose of improving cooling ability.

Since Sunaga et al., Franz et al. and Suzuki et al are in the same field of endeavor, the purpose disclosed by Suzuki et al. would have been recognized in the pertinent art of Sunaga et al. and Franz et al.

It would have been obvious at the time the invention was made to a person having an ordinary skill in the art to modify Sunaga et al. and Franz et al. by forming the heat sink wherein multiple fins located on the base surface of said heat sink are columnar and the multiple columnar fins are arranged on the base surface in a lattice-like configuration as taught by Kershaw et al. for the purpose of improving cooling ability.

Regarding claim 8, Suzuki et al. et al. also disclose heat sink structure said multiple fins located on the base surface of said heat sink are columnar and the multiple columnar fins are arranged on the base surface in a staggered configuration (view in the direction perpendicular to the front side) .

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh N Nguyen whose telephone number is (571) 272-2031. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg, can be reached on (571) 272-2044. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

HNN

December 28, 2004

  
DARREN SCHUBERG  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800